Standard Operating Procedure for Using the Genie-PC Gamma Spectroscopy System

1.0 Location

Room 309

2.0 Purpose

This system will qualitate and quantitate gamma radiation.

3.0 Applicability

This system will see any gamma ray in environmental samples or high activity samples.

4.0 References

Genie - PC Basic Operations - Canberra

5.0 Discussion

A standard of the same geometry as the sample, and known activity must be used to quantitate. An efficiency as well as an energy calibration is necessary. To qualitate an energy calibration is the only one needed.

6.0 Procedure

6.1 Fill liquid nitrogen dewar daily if using geranium detector. (Fill dewar and leave overnight before using.)

6.2 Turn the high voltage power supply to zero. Flip the toggle switch to ON, slowly increase the voltage to 500 volts, wait 30 seconds, slowly increase the voltage to 2500 volts and lock the dial.

6.3 When the safety power switch (blue box) red light is on, it indicates that a power failure has occurred. Turn off the high voltage and set the voltage dial to zero before resetting the power.

6.4 Turn on the switch for the computer and printer. (OS2)

6.5 From the desk top double click on genie-pc.

6.6 Double click on spectroscopy assistant.

6.7 Click on file.

6.8 Click on open workspace.

6.9 Click on Diane.WSP. Click on OK to collect a spectrum.

6.10 Under MCA view control, click on clear to clear spectrum on MCA.

6.11 Click on file, click on open data source.

6.12 Click on detector, click on HPGE, click on OK.

6.13 Click on MCA, click on acquire set up.

6.14 Click on live time and enter # of seconds, minutes or hours in the box, click on OK.

6.15 Click on clear.

6.16 Click on acquire on to collect spectrum on MCA.

6.17 If you desire to save the spectrum, click on file, click on save as and type the filename .CNF in the box, click on OK.

6.18 To energy calibrate after spectrum is collected click on file of Gamma Spectroscopy analysis.

6.19 Click on file, click on open data source, click on detector, click on HPGE if the current spectrum is to be used for calibration, or click on cam file and click on file of choice to use a stored file for calibration.

6.20 Click on calibrate, click on energy full, click on populate, click on certificate file, click on OK.

6.21 Click on appropriate file, click on OK.

6.22 If spectrum has never been energy calibrated, choose a low peak and click on the MCA, move up to the spectrum and click on the peak tip itself so the cursor appears there.

6.23 Click on expand on, the rubber rectangle must be over peak.

6.24 Move down to gamma spectroscopy analysis and click on cursor box - move to MCA and click on a peak midway in the spectrum on GSA and move rubber rectangle to the peak, click on tip of peak so cursor appears there.

6.25 Move down to GSA, click on cursor box.

6.26 Click on show and graph should show 45° angle with both energies on the curve, click on OK.

6.27 Click on auto.

6.28 Click on show, click on OK.

6.29 Delete peaks of short half life that aren't on the curve by clicking on the highlighted peak which will show energy in window and click on delete.

6.30 Click on show (energy coefficients should be about 0.5 kev/channel)

6.31 Click on print if desired, click on OK, click on OK.

6.32 Click on file, click on save.

6.33 To efficiency calibrate if the title on the MCA is HPGE, this indicates the spectrum currently displayed on the MCA: HPGE will be the one calibrated.

6.34 Click on calibrate.

6.35 Click on efficiency.

6.36 Click on populate.

6.37 Click on certificate file (use 1 for quantity if gammas/sec are for total sample). Click on OK.

6.38 Choose an appropriate file, click on OK.

6.39 Click on auto.

6.40 Click on energies to delete and click on delete box.

6.41 Click on show, click on print if desired, click on OK, click on OK.

6.42 Click on file, click on save.

6.43 Click on calibrate, click on store, fill in information, click on OK.

6.44 To use analyze first click on calibrate, click on load, click on correct efficiency file, click on OK.

6.45 Click on analyze, click on NID with report note: in sample info before analyzing a spectrum, enter the gms or liters and the quantity numerically so the efficiency calibration process can compare to the standard.

7.0 Quality Assurance/Quality Control

7.1 A check sample if available should be treated as the sample to check the accuracy of the energy and efficiency calibration.

8.0 Records

8.1 Raw data from the computer printout can be saved. After the data has been entered into the LIMS, the distribution sheet will be saved. The final results will be benched on each sample bench sheet.